



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
08/479,810	06/07/1995	JOHANNES G. BEDNORZ	YO987-074BY	8594

7590 10/20/2005

IBM CORPORATION
INTELLECTUAL PROPERTY LAW
P O BOX 218
YORKTOWN HEIGHTS, NY 10598

EXAMINER

KOPEC, MARK T

ART UNIT	PAPER NUMBER
----------	--------------

1751

DATE MAILED: 10/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

65

Office Action Summary	Application No. 08/479,810	Applicant(s) BEDNORZ ET AL.	
	Examiner Mark Kopec	Art Unit 1751	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 31 January 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-543 is/are pending in the application.
- 4a) Of the above claim(s) 73-76,82,83,377 and 378 is/are withdrawn from consideration.
- 5) ☒ Claim(s) See Continuation Sheet is/are allowed.
- 6) ☒ Claim(s) See Continuation Sheet is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Continuation of Disposition of Claims: Claims allowed are 113,114,123-125,135-138,140,151,157,167-169,172-174,177-179,185,186,189-191,196,197,213-216,220,221,224-226,231,258-260,264,265,269,270,276,277,280-282,287,288,296-301,304-307,311,312,315-317,502-507 and 511-515.

Continuation of Disposition of Claims: Claims rejected are 1-72,77-81,84-112,115-122,126-134,139,141-150,152-156,158-166,170,171,175,176,180-184,187,188,192-195,198-212,217-219,222,223,227-230,232-257,261-263,266-268,271-275,278,279,283-286,289-295,303,308-310,313,314,318-376 and 379-4501.

Art Unit: 1751

This action is responsive to:

Amendment filed 1/31/05;

First Supplemental amendment filed 3/1/05 (attach A-Z, AA);

Second Supplemental amendment filed 3/8/05 (claims 1-543,
remarks p137-157;

Third Supplemental amendment filed 4/5/05 (attach Ab-AG);

Fourth Supplemental amendment filed 4/5/05 (remarks p 2-3,
Poole article);

Fifth Supplemental amendment filed 4/5/05 (remarks p 2-4);

Sixth Supplemental Amendment filed 4/15/05 (remarks p 2-4).

The last version of claims filed appears with the Second
Supplemental Amendment filed 3/8/05. Claims 1-543 are currently
pending.

Claims 73-76, 82-83 and 377-378 are withdrawn from
consideration as being drawn to a non-elected invention
(process).

The **Petition** under 37 C.F.R. §1.181 or 1.182 has been
entered. Note the **Decision on Petition** mailed 7/15/05. The
examiner believes that the remarks below address each of the
issues raised in conjunction with the Petition. The remarks
below also address the attachments and remarks filed in the
subsequent amendments.

Art Unit: 1751

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

The rejection of claims 322-360 under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement is withdrawn in view of applicant's arguments and amendments.

The objection of claims 211, 256, 302 and 394 is withdrawn in view of applicant's remarks (pages 114-115 of Response filed 1/31/05). The claims do not require both a Group IIA element or a rare earth element and a Group IIIB element.

Claims 1-5, 7-11, 17, 19, 23, 28, 52-54, 59, 65, 72, 77-81, 86, 87, 94, 96-108, 144, 145, 149, 150, 152-156, 158-161, 165, 166, 170, 171, 175, 176, 180, 181, 235, 236, 240, 241-252, 257, 261, 262, 266, 267, 271, 272, 361-413 and newly added 414-427, 433, 434, 446, 448, 466-495 and 537-539 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

This rejection is maintained for the reasons set forth in the Rejection mailed 7/28/04 (pages 4-5).

Claims 1-64, 66-72, 84, 85, 88-96, 100-102, 109-112, 115-122, 126-134, 139, 141-143, 146-149, 153-155, 162-166, 182-184, 187, 188, 192-195, 198-212, 217-219, 222, 223, 227-230, 232-234,

Art Unit: 1751

237-240, 244-246, 253-257, 268, 273-275, 278, 279, 283-286, 289-295, 302, 303, 308-310, 313, 314, 318-329, 331-334, 337-345, 347-357, 359-374, 376, 379, 380, 382, 383, 389, 394, 395, 402, 407, 408 and 414-501, 508-510, 516-543 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for compositions comprising a transition metal oxide containing at least a) an alkaline earth element or Group IIA element and b) a rare-earth element or Group IIIB element, does not reasonably provide enablement for the invention as claimed. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims.

This rejection is maintained for the reasons set forth in the Rejection mailed 7/28/04 (pages 5-8).

Applicant remarks regarding these rejections have been fully considered. A rebuttal follows below.

In arguing the instant enablement rejection, applicant contends that the examiner has not provided any factual evidence that the art of high temperature superconductivity is an extremely unpredictable one. Applicant's statements include:

Applicants request that the Examiner provide an Examiner's affidavit showing that the Examiner has expertise to make such a statement not supported by

Art Unit: 1751

documented factual evidence (Response filed 1/31/05, page 119).

The examiner should withdraw the rejection, provide factual evidence to support the opinion or submit an examiner's affidavit under MPEP 706.02(a) qualifying himself as an expert in the art of high Tc superconductivity to offer such a conclusory opinion (Response filed 1/31/05, page 121).

The examiner has provided no evidence to support the statement 'that at the time the invention was made, the theoretical mechanism of superconductivity in these materials was not well understood. This mechanism is still not understood'. Applicant's request the Examiner to introduce evidence to support this statement or to place an examiner's affidavit under MPEP 706.02(a) qualifying himself as an expert to make this statement (Response filed 1/31/05, page 136).

Enclosed are articles relating to experimental and theoretical work on superconductivity.

Schuller et al "A Snapshot View of High Temperature Superconductivity 2002" (report from workshop on High Temperature Superconductivity held April 5-8, 2002 in San Diego) discusses both the practical applications and theoretical mechanisms relating to superconductivity. At page 4, the reference states:

Basic research in high temperature superconductivity, because the complexity of the materials, brings together expertise from materials scientists, physicists and chemists, experimentalists and theorists... It is important to realize that this field is based on complex

Art Unit: 1751

materials and because of this materials science issues are crucial. Microstructures, crystallinity, phase variations, nonequilibrium phases, and overall structural issues play a crucial role and can strongly affect the physical properties of the materials. Moreover, it seems that to date there are no clear-cut directions for searches for new superconducting phases, as shown by the serendipitous discovery of superconductivity in MgB_2 . Thus studies in which the nature of chemical bonding and how this arises in existing superconductors may prove to be fruitful. Of course, "enlightened" empirical searches either guided by chemical and materials intuition or systematic searches using well-defined strategies may prove to be fruitful. It is interesting to note that while empirical searches in the oxides, gave rise to many superconducting systems, similar (probable?) searches after the discovery of superconductivity in MgB_2 have not uncovered any new superconductors.

At pages 5-6, the reference states:

The theory of high temperature superconductivity has proven to be elusive to date. This is probably as much caused by the fact that in these complex materials it is very hard to establish uniquely even the experimental phenomenology, as well as by the evolution of many competing models, which seem to address only particular aspects of the problem. The Indian story of the blind men trying to characterize the main properties of an elephant by touching various parts of its body seems to be particularly relevant. It is not even clear whether there is a single theory of superconductivity or whether various mechanisms are possible. Thus it is impossible to

Art Unit: 1751

summarize, or even give a complete general overview of all theories of superconductivity and because of this, this report will be very limited in its theoretical scope.

At page 7, the reference states:

Thus far, the existence of a totally new superconductor has proven impossible to predict from first principles. Therefore their discovery has been based largely on empirical approaches, intuition, and even serendipity. This unpredictability is at the root of the excitement that the condensed matter community displays at the discovery of a new material that is superconducting at high temperature.

In a published article entitled "Exploring Superconductivity" published at <http://www.nobelchannel.com/learningstudio/introduction>), states:

It is worth noting that there is no accepted theory to explain the high-temperature behavior of this type of compound. The BCS theory, which has proven to be a useful tool in understanding lower-temperature materials, does not adequately explain how the Cooper pairs in the new compounds hold together at such high temperatures. When Bednorz was asked how high-temperature superconductivity works, he replied, "If I could tell you, many of the theorists working on the problem would be very surprised."

It is clear from these articles, published well after the filing date of the instant application, that the art is still considered complex and unpredictable, and that no single theory

Art Unit: 1751

for the mechanism responsible for superconductivity has been generally accepted.

Applicant has taken the position that the instant "apparatus" claims do not require the instant specification be fully enabled for the claimed superconductive compositions. At page 157 of the response filed 1/31/05, applicant states "Notwithstanding, since the claims are apparatus and device claims, Applicants do not believe that they are required to provide a teaching of how to fabricate all compositions which may be used within the full scope of Applicant's claimed invention". The examiner respectfully disagrees. The examiner respectfully maintains that the instant claims must be enabled for all aspects of the claimed invention, including compositions utilized therein. Such is the basis of applicant's invention. The examiner does not deny that the instant application includes "all know principles of ceramic science", or that once a person of skill in the art knows of a specific type of composition which is superconducting at greater than or equal to 26K, such a person of skill in the art, using the techniques described in the application, which included all principles of ceramic fabrication known at the time the application was initially filed, can make the known superconductive compositions. The numerous 1.132 declarations, such as those of Mitzi, Shaw,

Art Unit: 1751

Dinger and Duncombe, and the Rao article, are directed to production of known superconductive materials. What is not a "matter of routine experimentation" in this complex, unpredictable art is arriving at superconductive compositions outside the scope of the allowable claims (e.g., subsequently discovered BSCCO or Tl-systems as disclosed in Rao (see response filed 3/8/05, pages 141-143)). The examiner respectfully maintains that the instant disclosure has not provided sufficient guidance to produce such materials. At page 125 of the response filed 1/31/05, applicant argues *In re Fisher* (166 USPQ 18) emphasizing "It is apparent that such an inventor should be allowed to dominate the future patentable inventions of others where those inventions were based in some way on his teachings". The examiner respectfully submits the remaining statements of *Fisher* are equally important:

It is equally apparent, however, that he must not be committed to achieve this dominance by claims which are insufficiently supported and hence, not in compliance with the first paragraph of 35 USC 112. That paragraph requires the scope of the claims must bear a reasonable correlation to the scope of enablement provided by the specification to persons of ordinary skill in the art... In cases involving unpredictable factors such as most chemical reactions... the scope of enablement obviously varies inversely with the degree of unpredictability of the factors involved...

Art Unit: 1751

While applicant argues "domination", the issue of "reasonable correlation to the scope of enablement" is as important. At several instances the remarks, applicant has stated "In the present invention Applicants have provided a teaching (and proof thereof) of how to make all known high Tc materials useful to practice their claimed invention" (reply filed 1/31/05, page 152). The examiner respectfully disagrees. Applicant has provided an enabled disclosure for superconductive compositions containing a transition metal oxide containing at least a) an alkaline earth element and b) a rare-earth element of Group IIIB element (pages 5-8 of Rejection mailed 2/28/04). The fact that other subsequently discovered superconductive systems (such as BSCCO) may be made by "general principles of ceramic science" does not provide enablement for the claimed invention. The state of the art for a given technology is not static in time. The state of the art must be evaluated based on the application filing date. Whether the specification would have been enabling as of the filing date involves consideration of the nature of the invention, the state of the prior art, and the level of skill in the art. The initial inquiry is into the nature of the invention, i.e., the subject matter to which the claimed invention pertains. The nature of the invention becomes the backdrop to determine the state of the art and the level of

Art Unit: 1751

skill possessed by one skilled in the art. The state of the prior art is what one skilled in the art would have known, at the time the application was filed, about the subject matter to which the claimed invention pertains. A conclusion of lack of enablement means that, based on the evidence regarding each of the factors discussed in the rejection, the specification, at the time the application was filed, would not have taught one skilled in the art how to make and/or use the full scope of the claimed invention without undue experimentation. In re Wright, 999 F.2d 1557,1562, 27 USPQ2d 1510, 1513 (Fed. Cir. 1993).

In discussing the Rao article at page 169 of the response filed 1/31/05, applicant states:

It thus is clear that broader claims than allowed should be allowed since it is clear that the allowed claims can be avoided following applicant's teaching without undue experimentation. Applicants are entitled to claims which encompass these materials since they were made following Applicants' teaching.

The examiner does not dispute that Rao acknowledges that applicant initiated the study of high temperature superconductivity, or that a large number of oxides are prepared by the general principles of ceramic science. However, the examiner maintains that such superconductive compounds cannot be made by following applicants teaching without undue experimentation. These are materials subsequently discovered by

Art Unit: 1751

others. Applicant are entitled to claims, apparatus or otherwise, which are fully enabled by the instant specification at the time of filing. For the reasons clearly set forth in the rejection, after carefully reviewing the instant disclosure including all examples and statements included therein, the examiner respectfully maintains that the instant claims are enabled for superconductive compositions containing a transition metal oxide containing at least a) an alkaline earth element and b) a rare-earth element of Group IIIB element (pages 5-8 of Rejection mailed 2/28/04).

Additionally, applicant's remarks regarding the Asahi Shinbum article are noted (pages 178-180 of the remarks filed 1/31/05). Applicant contends "Since Applicant's original article is the only information enabling the Asahi Shinbumk article, it logically follows that the Examiner necessarily concludes that all Applicant's claims are fully enabled". The examiner respectfully disagrees. A careful review of the article discloses "an oxide compound of La and Cu with Barium which has a structure of the so-called perovskites". No specific stoichiometry is proposed. Even if this disclosure were available as a prior publication, the examiner contends that the article may not be applied as operable prior art. The disclosure in an assertedly anticipating reference must provide

Art Unit: 1751

an enabling disclosure of the desired subject matter; mere naming or description of the subject matter is insufficient, if it cannot be produced without undue experimentation. *Elan Pharm., Inc. v. Mayo Foundation for Medical and Education Research*, 346 F.3d 1051, 1054, 68 USPQ2d 1373, 1376 (Fed. Cir. 2003).

With respect to applicants remarks regarding portions of the file history, applicant contends that the prior art rejections in parent application 07/053,307 (composition claims), conclusively lead to the conclusion "...all of the instant claims are fully enabled because the Examiner has stated that the compositions of matter recited in the claims may be made with the knowledge of a person of skill in the art prior to Applicant's filing date" (pages 181-183 of the remarks filed 1/31/05). Again, the examiner respectfully disagrees. It appears that the references were cited and applied as inherently possessing the claimed superconductive characteristics. They have no disclosure relating to superconductivity, and appear to have little or no bearing on the scope of enablement issues of the instant claims.

As stated above, the examiner sincerely believes that the above remarks address each of applicant's concerns set forth in

Art Unit: 1751

the Petition filed 1/31/05, as well as the additional remarks and attachment filed subsequently.

Note the following new grounds of rejection:

Claims 438-440 and 453 are rejected over applicants admitted prior art.

Specifically, these claims do not require the presence of any superconductive compound or composition. They recite only "means for conducting a superconducting current...". The examiner construes these limitations to read on any device(s) which test for superconductivity. Applicant admits such were known prior to the filing of the instant specification (response filed 1/31/05, page 176).

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will

Art Unit: 1751

expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark Kopec whose telephone number is (571) 272-1319. The examiner can normally be reached on Monday - Friday from 9:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Yogendra Gupta can be reached on (571) 272-1316. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1751

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Mark Kopec
Primary Examiner
Art Unit 1751

MK

October 11, 2005